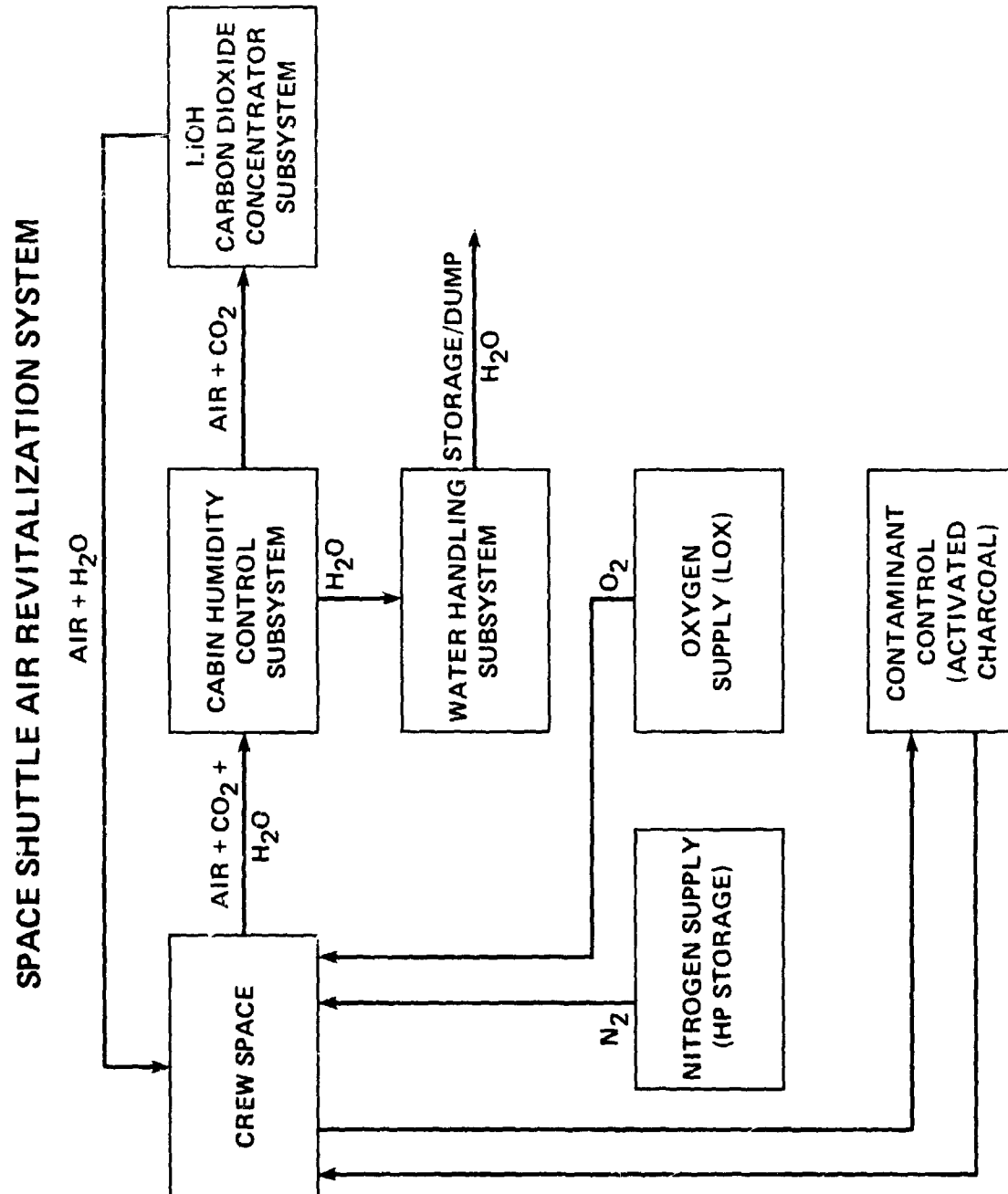


N85-29548

QUATTRONE FIGURE 1

SPACE SHUTTLE AIR REVITALIZATION
SYSTEM

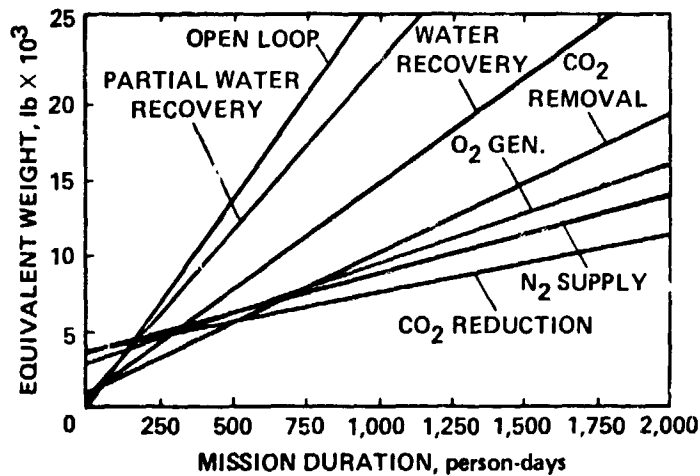


QUATRONE

FIGURE 2

REGENERATIVE vs OPEN LOOP ECLSS
TRADE-OFFZ

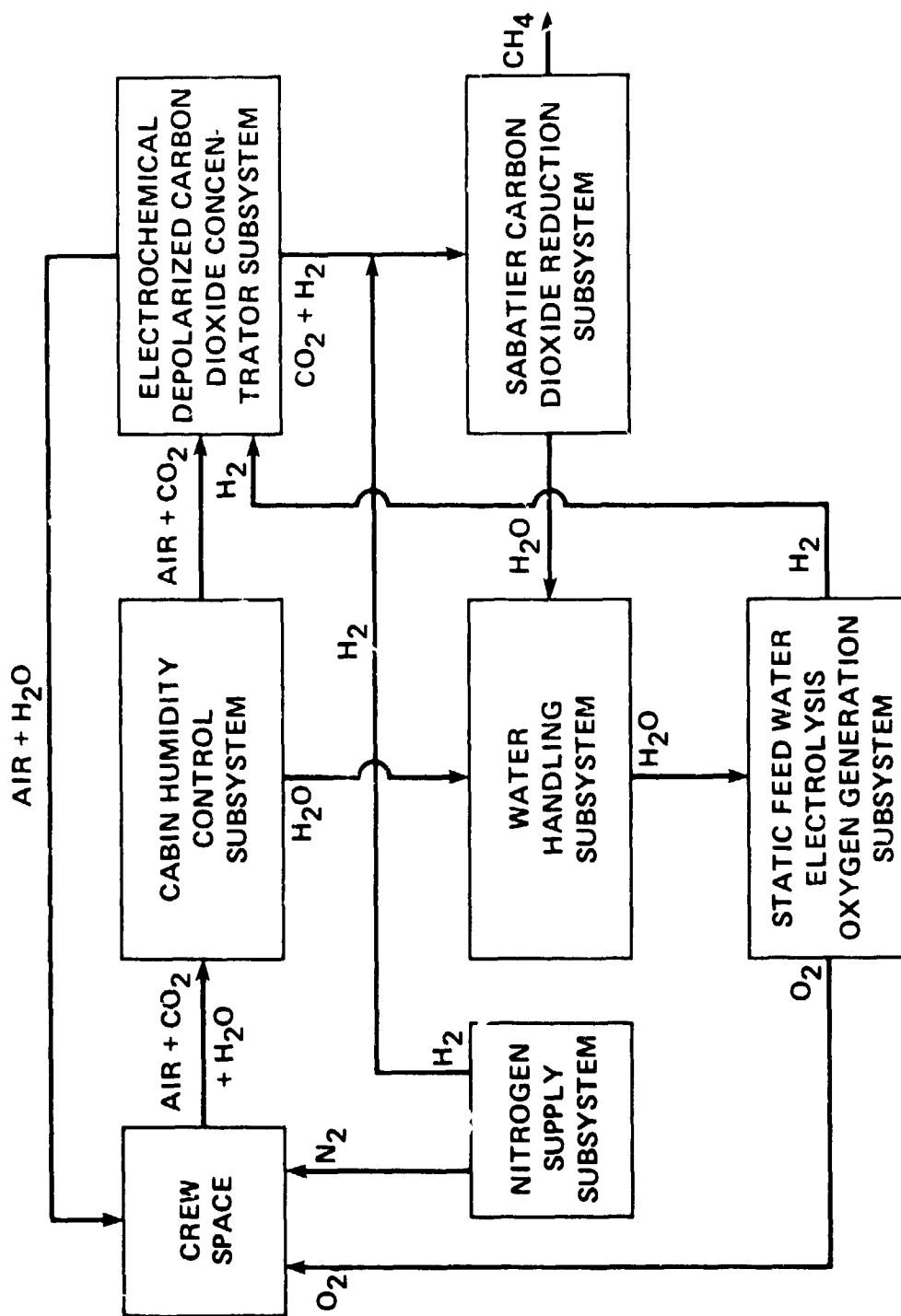
REGENERATIVE vs OPEN LOOP EC/LSS



SEQUENTIAL STEPS IN LOOP CLOSURE

DEFINITION	DESCRIPTION
PARTIAL WATER RECOVERY	HUMIDITY CONDENSATE COLLECTION
WATER RECOVERY	POTABLE WATER RECOVERY AND TREATMENT FROM URINE AND WASH WATER
CO ₂ REMOVAL (NONEXPENDABLE)	REPLACEMENT OF EXPENDABLE LiOH WITH REGENERATIVE CO ₂ COLLECTION TECHNIQUE
O ₂ GENERATION	GENERATION OF O ₂ THROUGH WATER ELECTROLYSIS USING RECLAIMED WATER
N ₂ GENERATION	GENERATION OF N ₂ THROUGH DISSOCIATION OF HYDRAZINE
CO ₂ REDUCTION	DECREASE IN EXPENDABLE WATER BY RECOVERING PRODUCT FROM CO ₂ REDUCTION (SABATIER) PROCESS

REGENERATIVE AIR REVITALIZATION SYSTEM

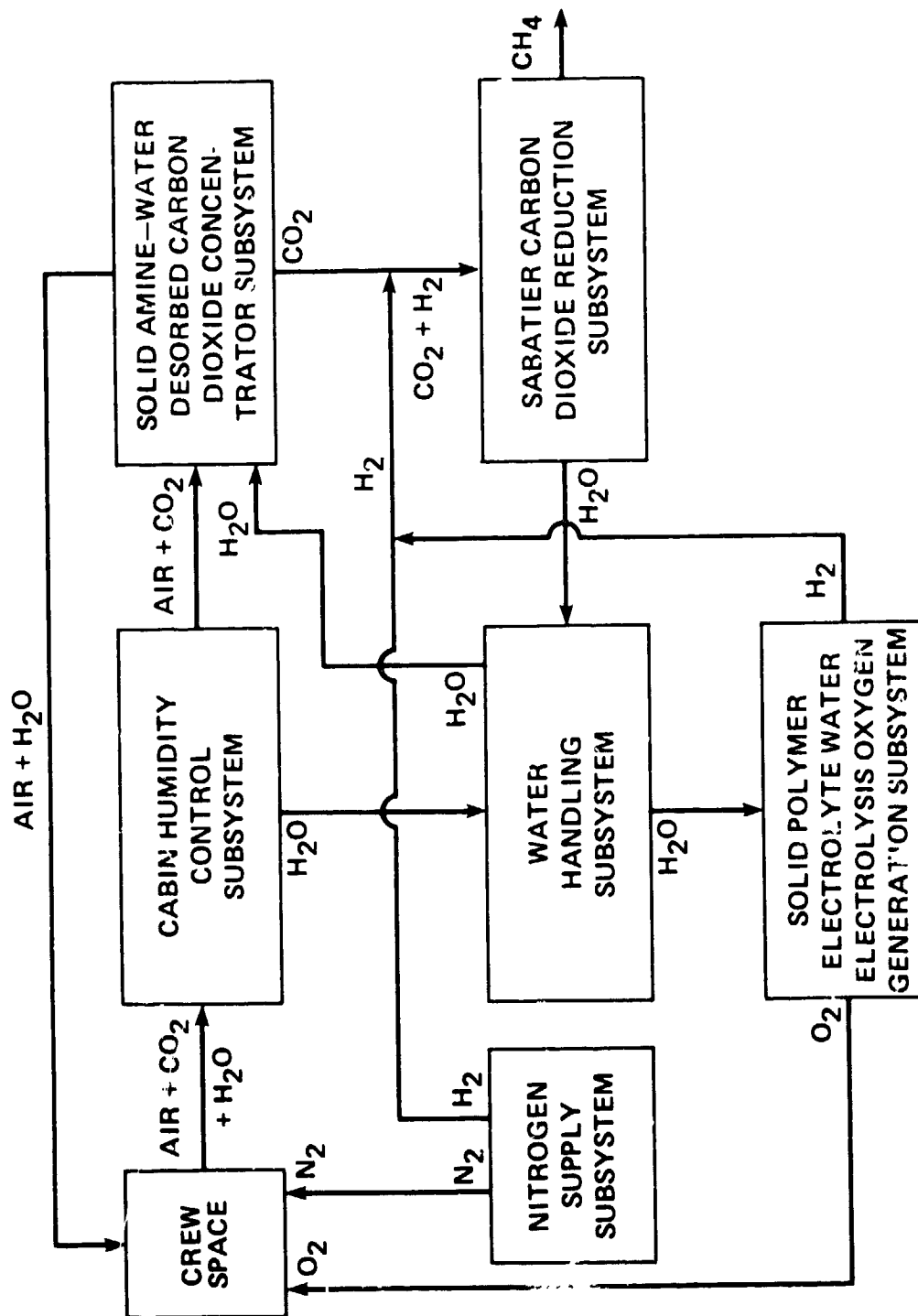


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FIGURE 3

REGENERATIVE AIR REVITALIZATION
SYSTEM SCHEMATIC

REGENERATIVE AIR REVITALIZATION SYSTEM



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FIGURE 4

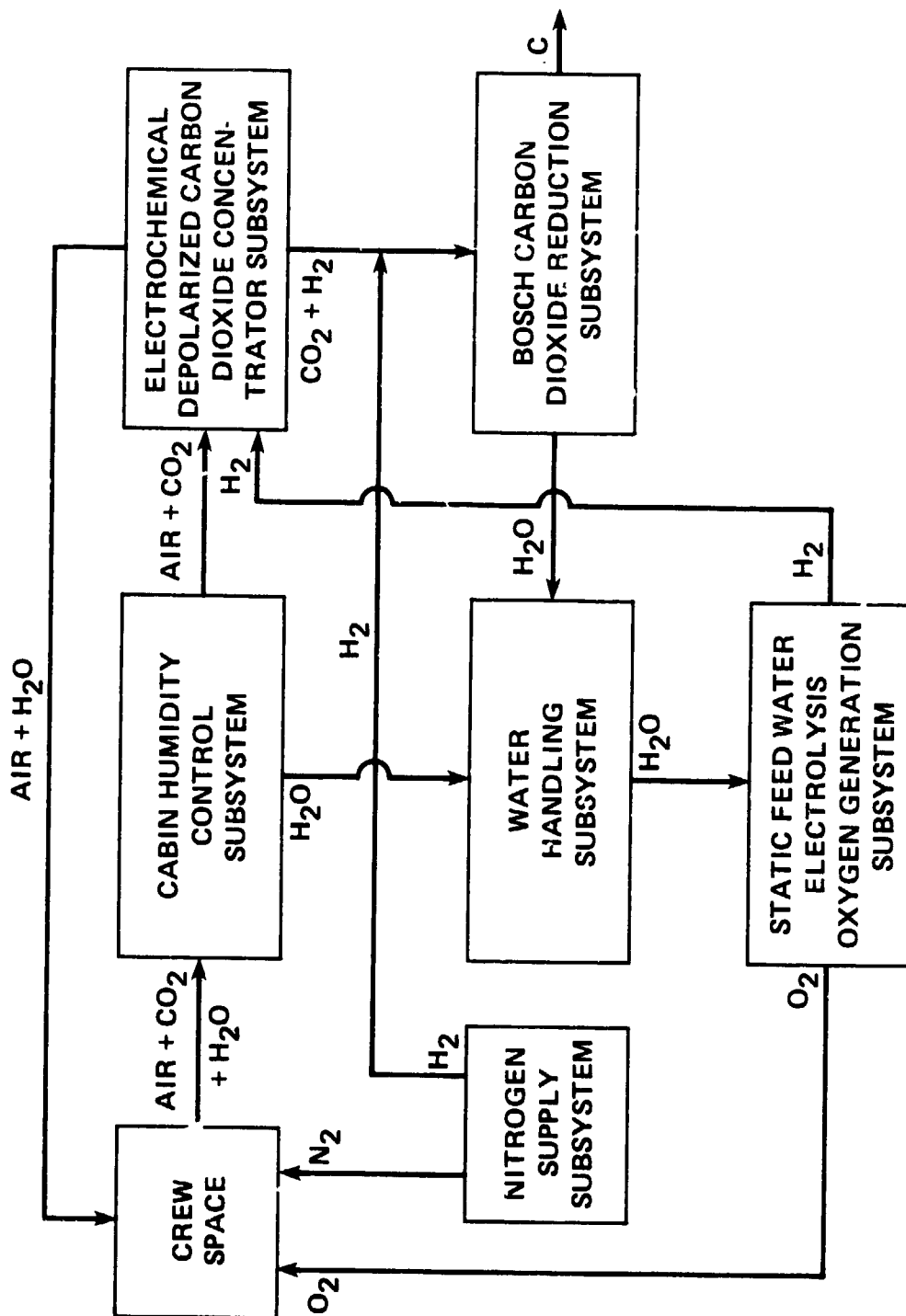
REGENERATIVE AIR REVITALIZATION
SYSTEM SCHEMATIC

QUATTRONE

FIGURE 5

REGENERATIVE AIR VITALIZATION
SYSTEM SCHEMATIC, NUMBER 2.

REGENERATIVE AIR REVITALIZATION SYSTEM

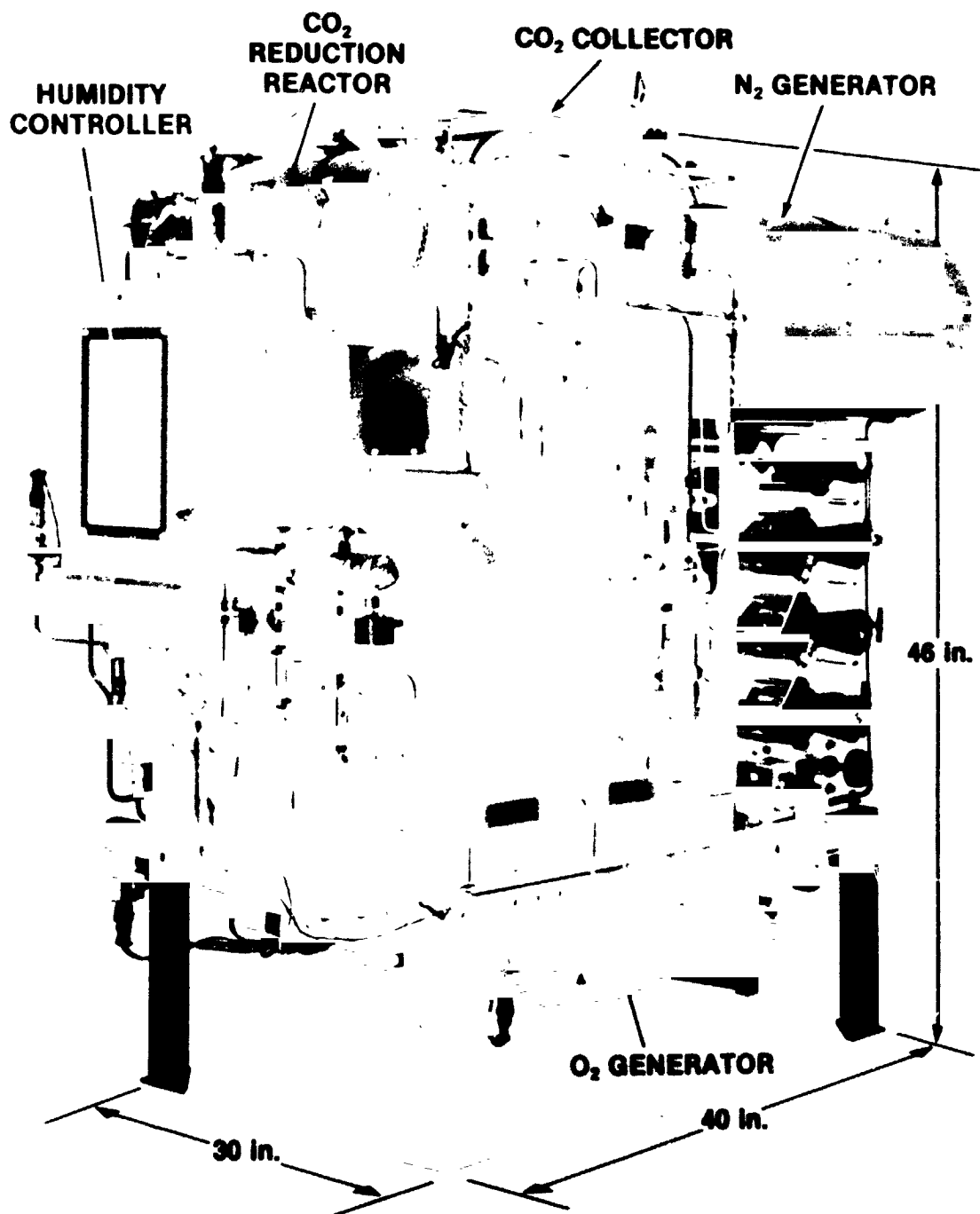


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QUATTRONE

FIGURE 6

EXPERIMENTAL AIR REVITALIZATION
SYSTEM



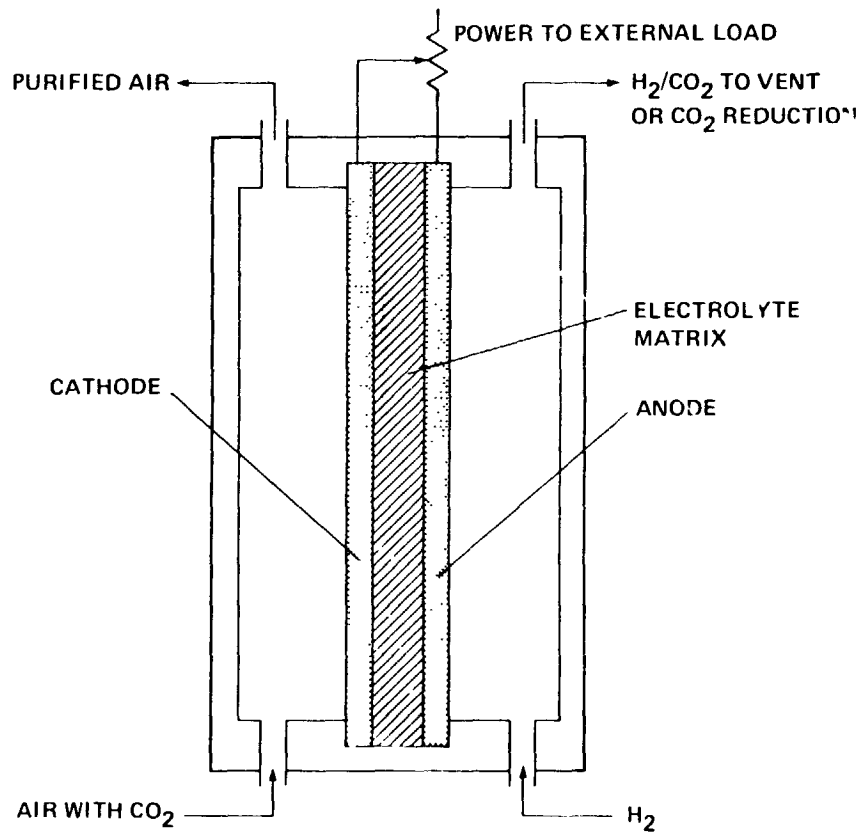
ORIGINAL FIGURE
OF POOR QUALITY

QUATTRONE

FIGURE 8

ELECTROCHEMICAL DEPOLARIZED CARBON
DIOXIDE CONCENTRATOR CELL
SCHEMATIC

EDC CELL FUNCTIONAL SCHEMATIC



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OF POOR QUALITY

QUATTRONE FIGURE 9
ELECTROCHEMICAL DEPOLARIZED CARBON
DIOXIDE CONCENTRATOR SUBSYSTEM

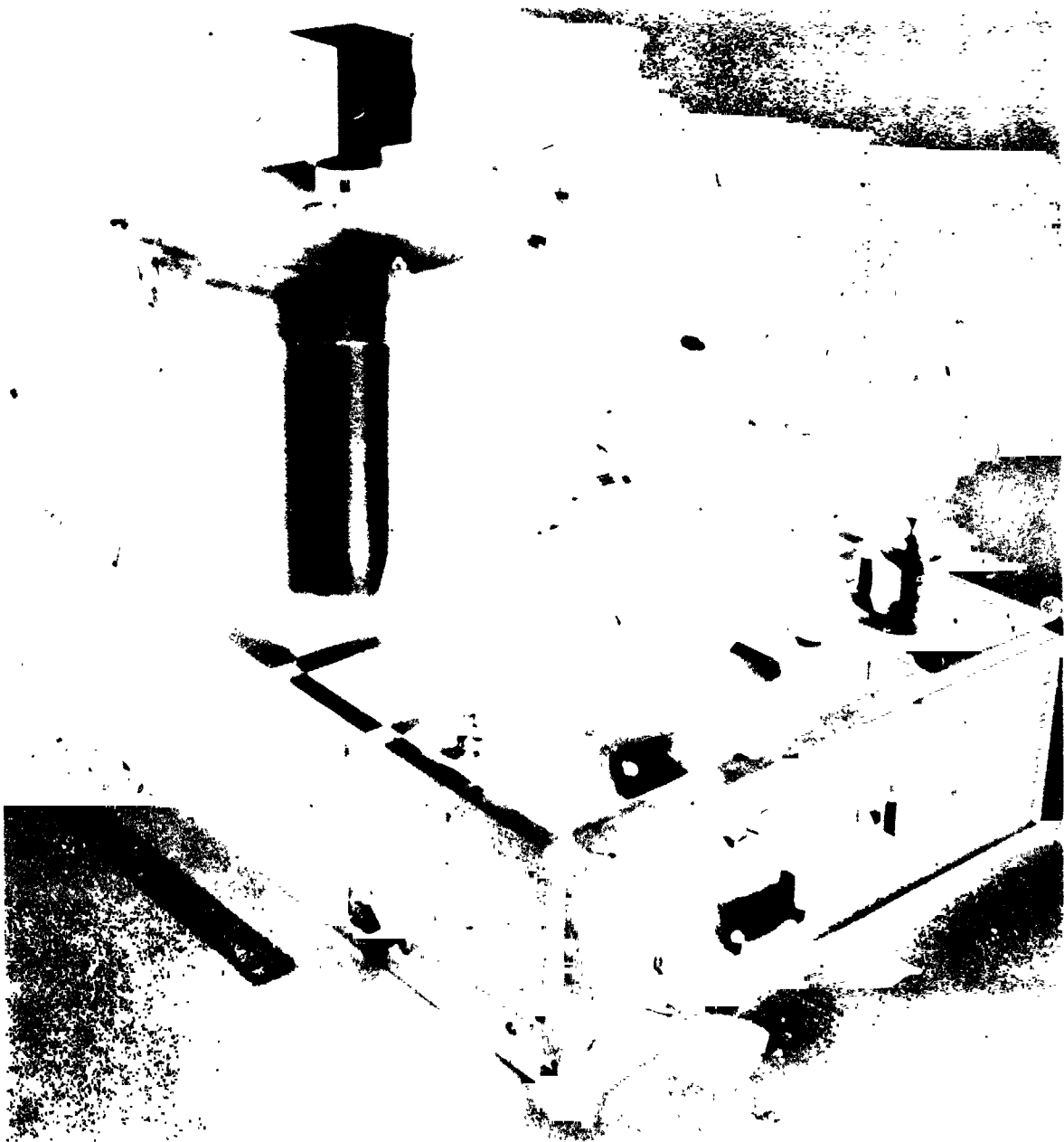


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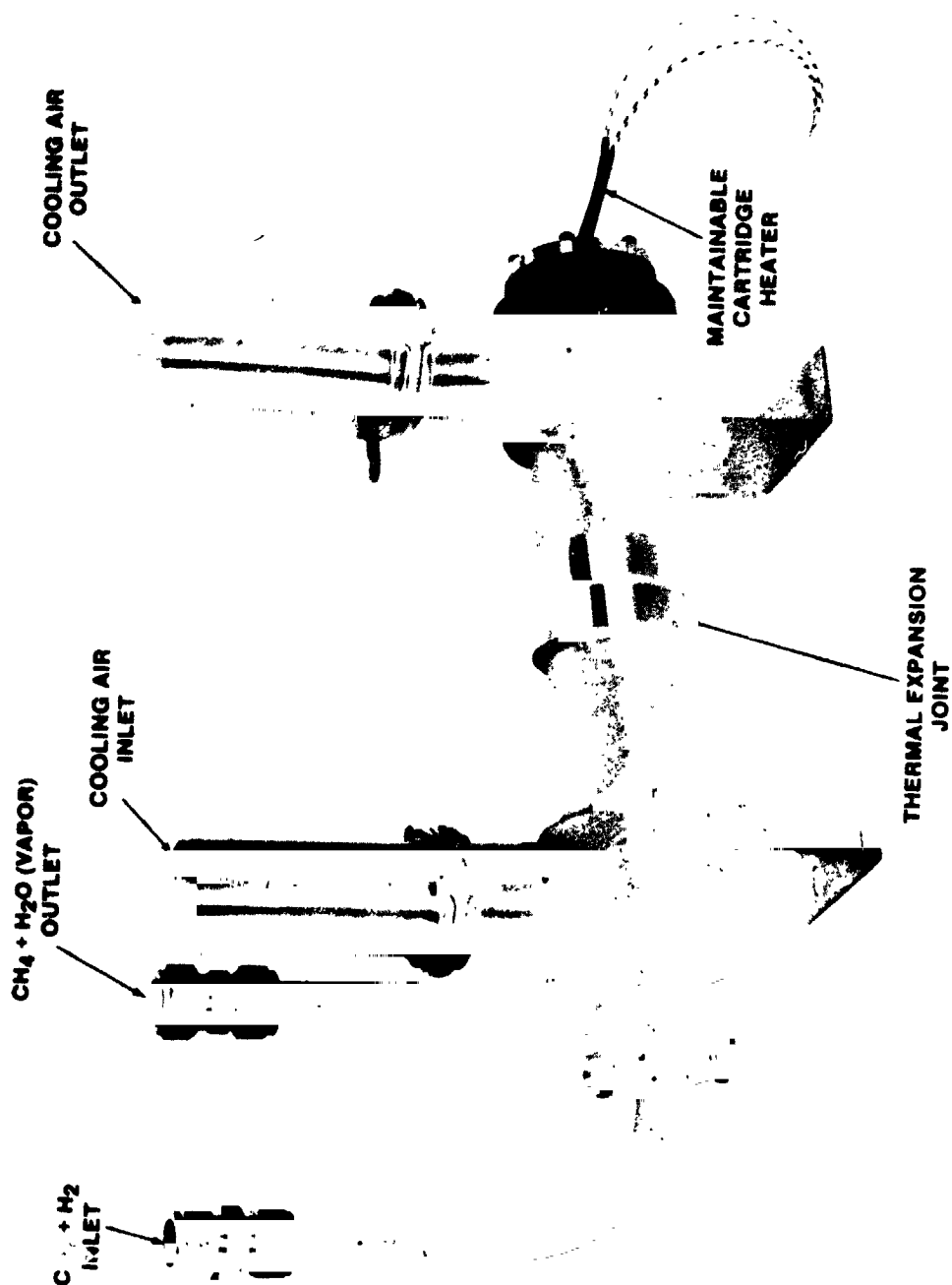
FIGURE 10

SOLID AMINE-WATER DESORBED CARBON
DIOXIDE CONCENTRATOR SUBSYSTEM



QUATRONE
SABATIER CARBON DIOXIDE
REDUCTION SUBSYSTEM

FIGURE 11



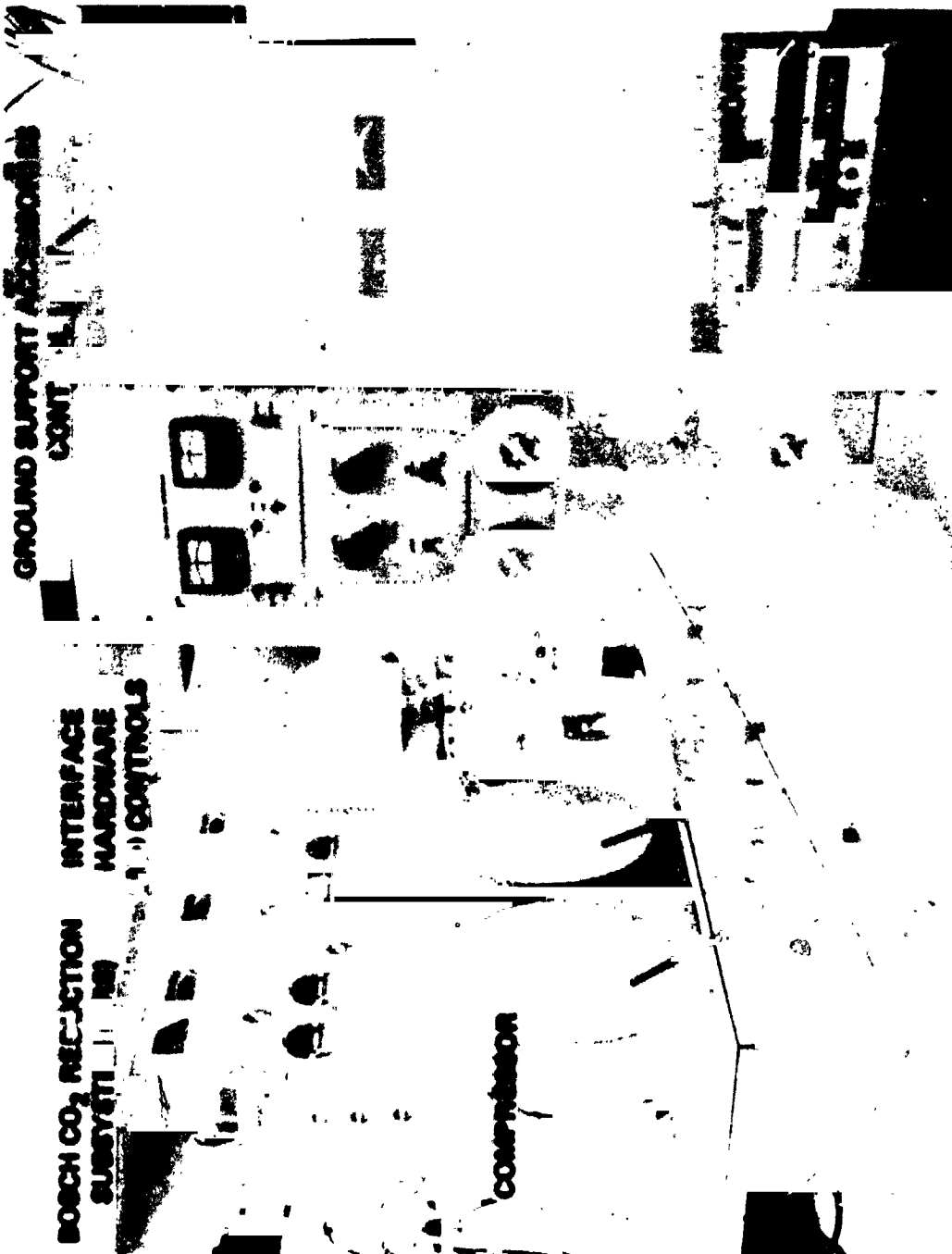
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FIGURE 12

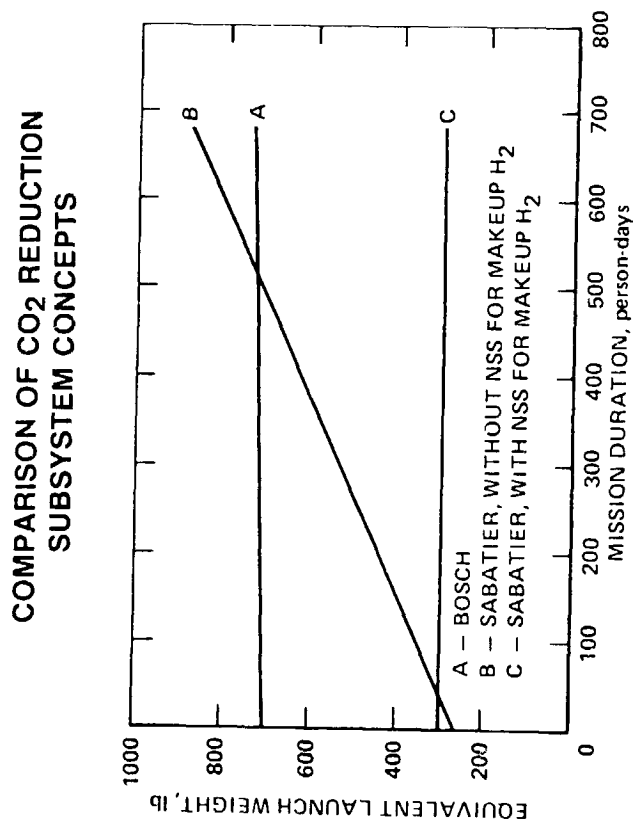
BOSCH CARBON DIOXIDE REDUCTION
SUBSYSTEM

BOSCH LABORATORY BREADBOARD SUBSYSTEM



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QUATRONE
SABATIER/BOSCH TRADE-OFF COMPARISON



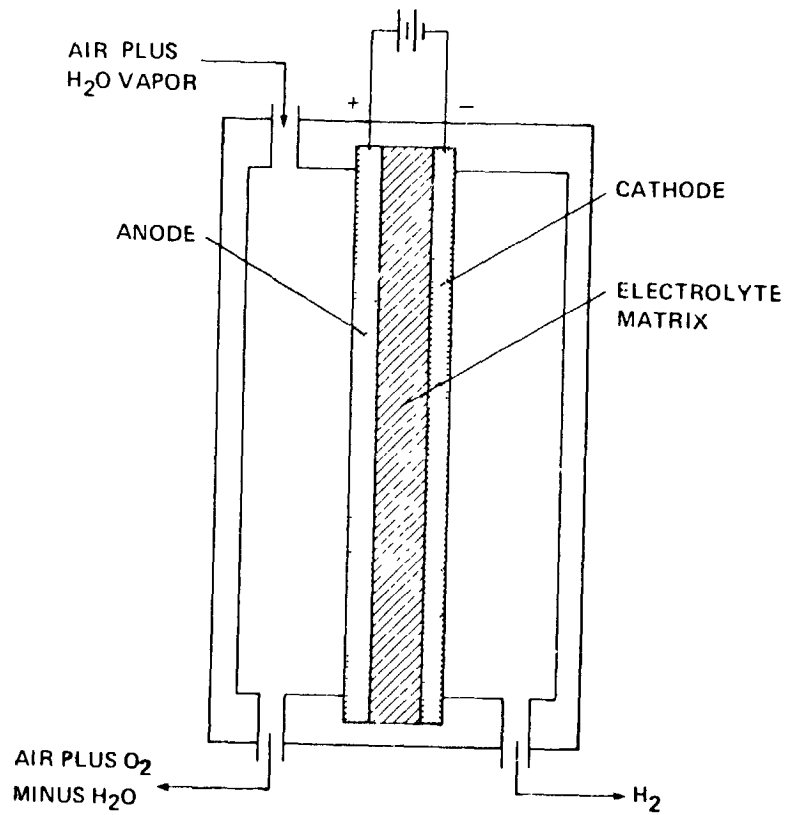
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QUATRONE

FIGURE 14

WATER VAPOR ELECTROLYSIS CELL
SCHEMATIC

WVE CELL FUNCTIONAL SCHEMATIC

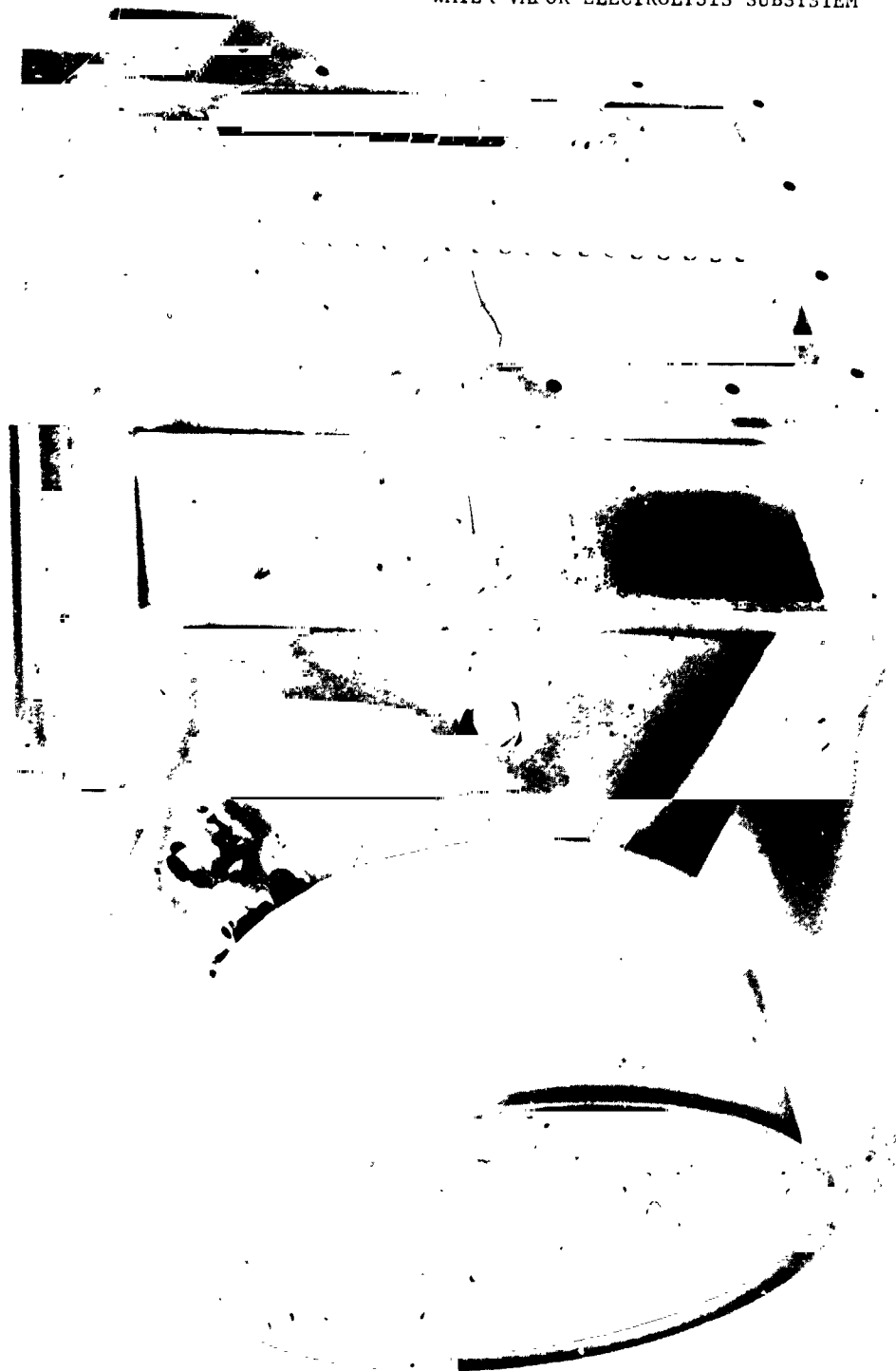


OF FOUR QUARTY

QUATRONE

FIGURE 15

WATER VAPOR ELECTROLYSIS SUBSYSTEM

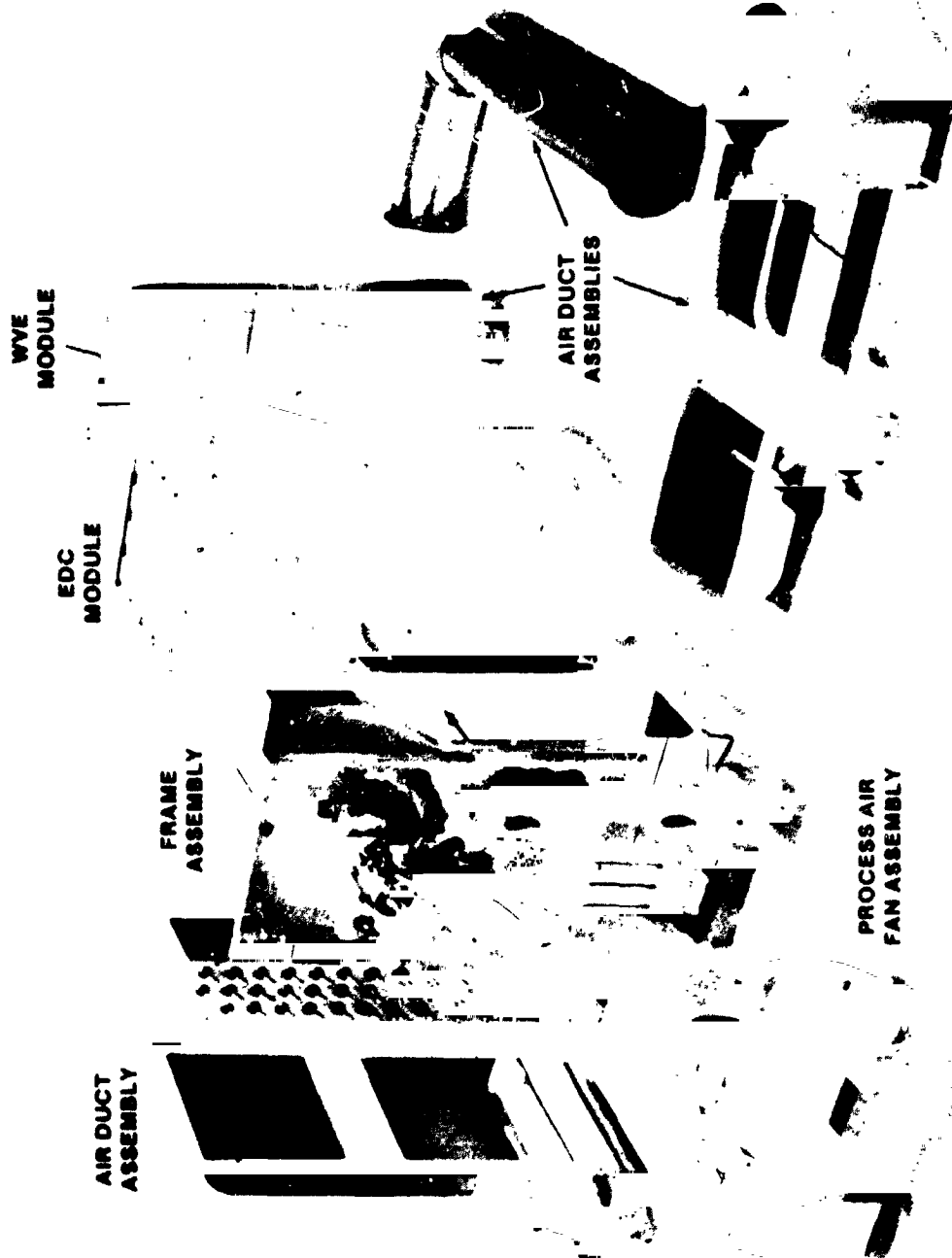


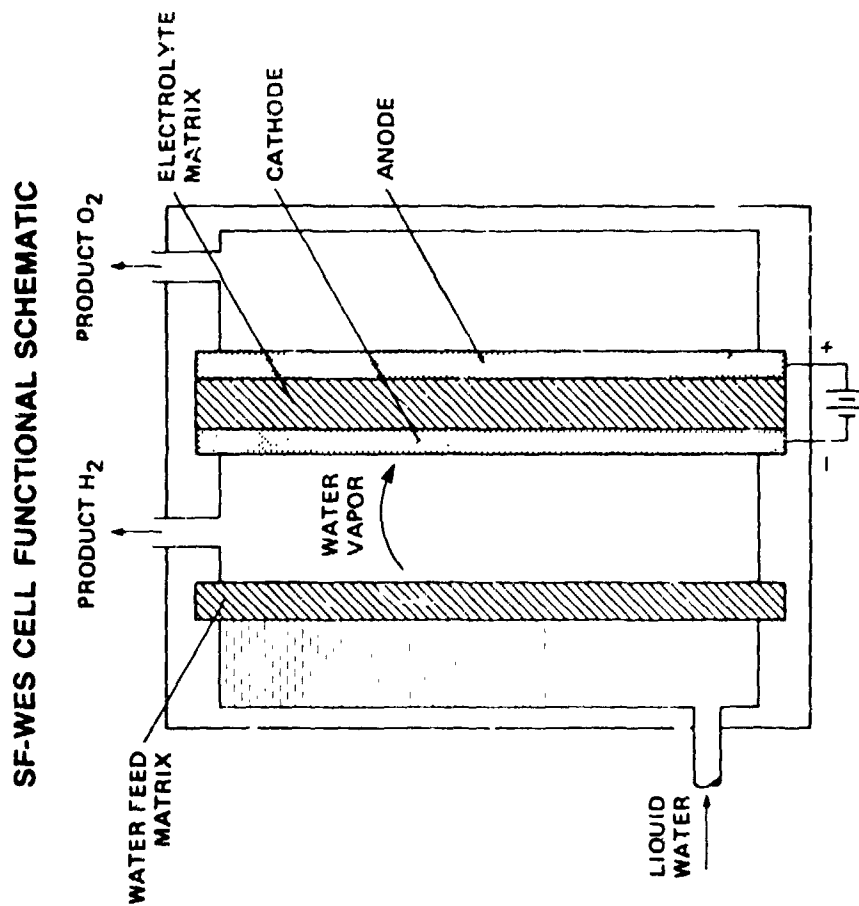
QUATTRONE

FIGURE 16

INDEPENDENT AIR REVITALIZATION SYSTEM

IARS RLSE DEVELOPMENT HARDWARE





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FIGURE 18

STATIC FEED WATER ELECTROLYSIS
SUBSYSTEM

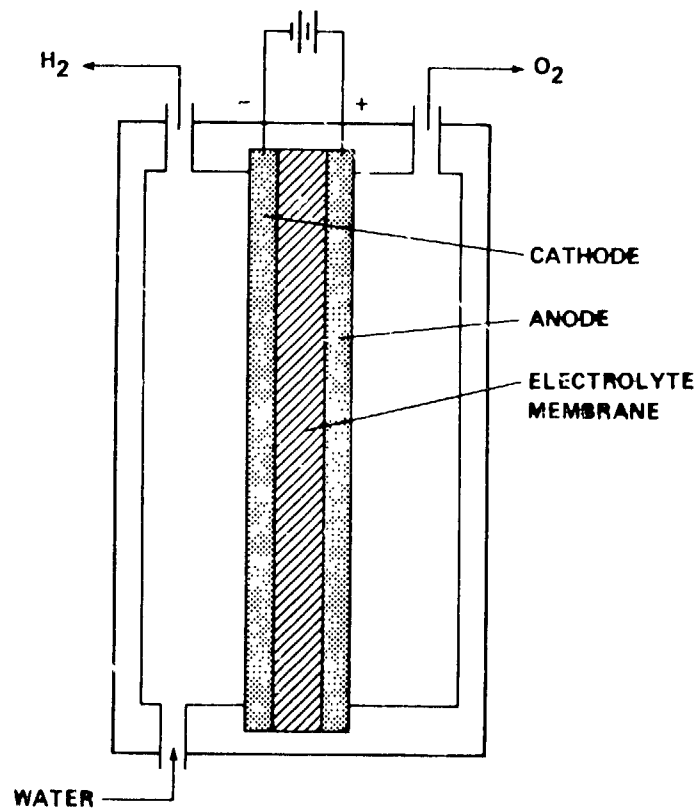


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FIGURE 19

SOLID POLYMER ELECTROLYTE WATER
ELECTROLYSIS CELL SCHEMATIC

SPE-WES CELL FUNCTIONAL SCHEMATIC



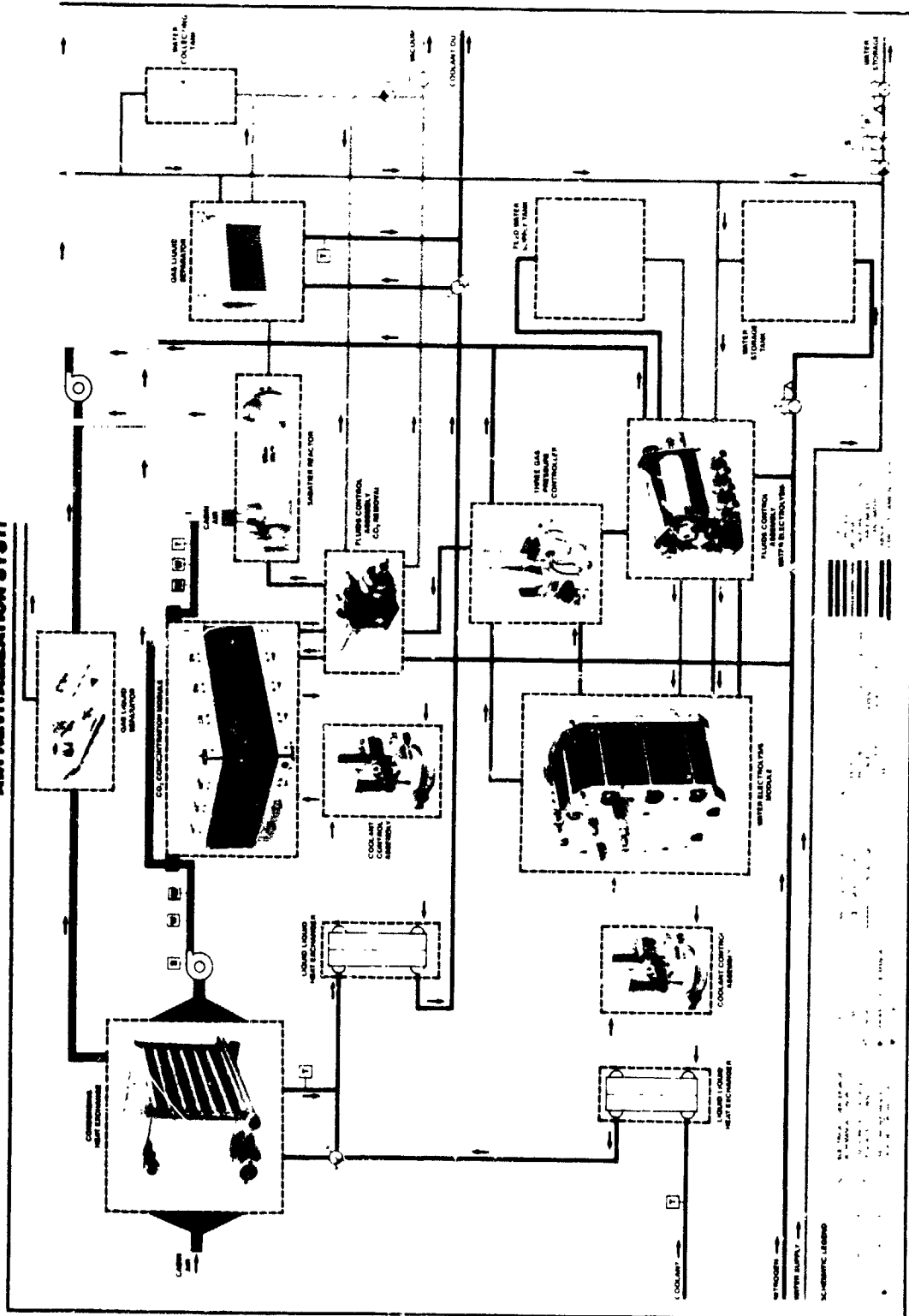
RLSE SPE-WES MODULE

QUATRONE
FIGURE 20
SOLID POLYMER ELECTROLYTE WATER
ELECTROLYSIS MODULE

PRESSURE
HOUSING

CELL
STACK

FIGURE 21
QUATRONE
AIR REVITALIZATION SYSTEM SCHEMATIC



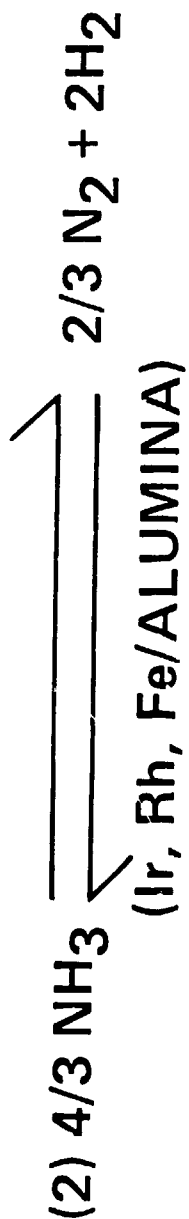
QUATTRONE FIGURE 22
NITROGEN GENERATION REACTIONS

NITROGEN GENERATION

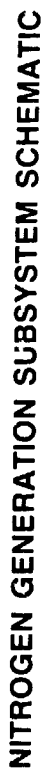
(1000 °K; 200 PSIA)



(PT)



NITROGEN SUPPLY SUBSYSTEM STAGING SCHEMATIC



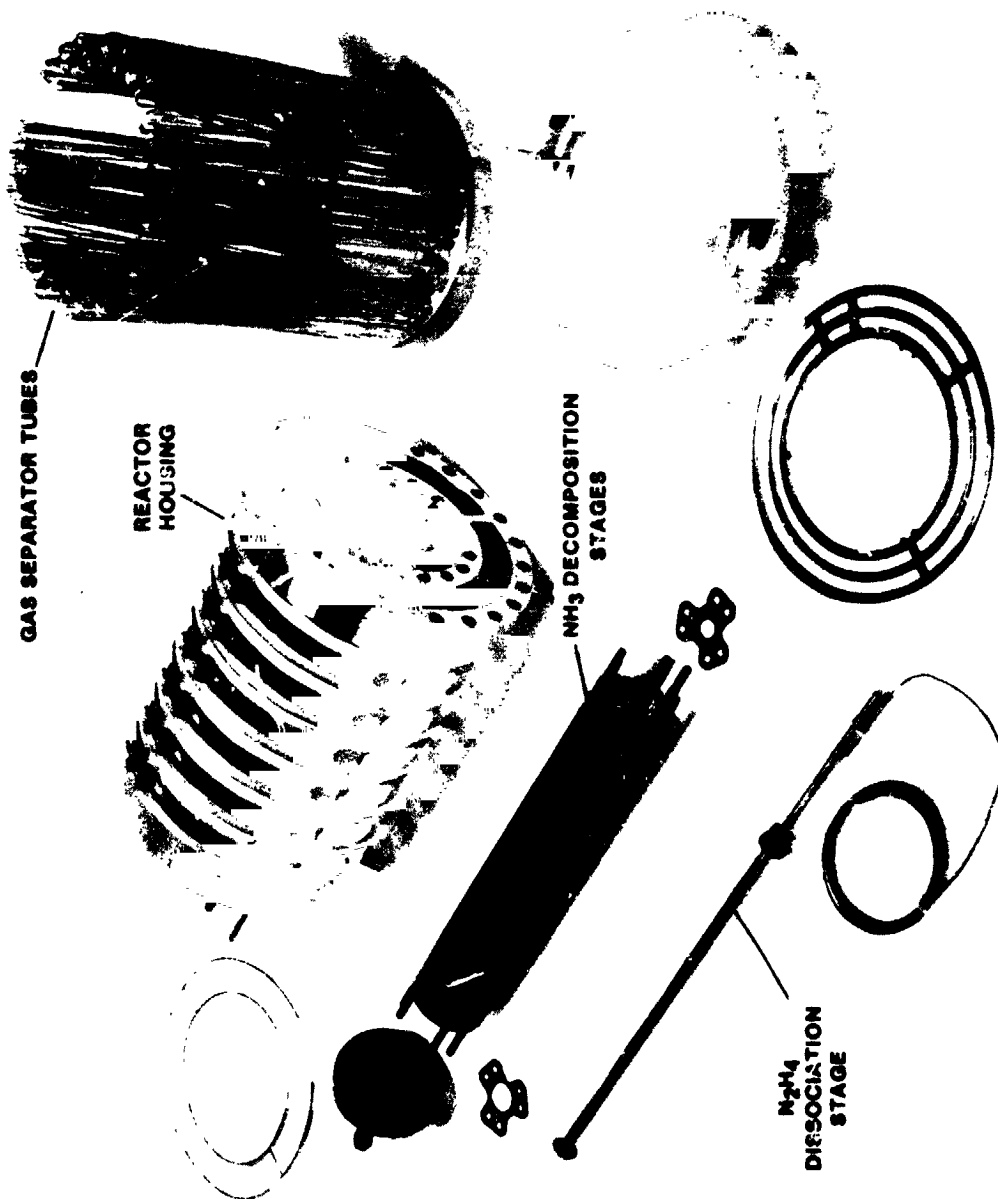
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FIGURE 24

NITROGEN SUPPLY SUBSYSTEM MODULE

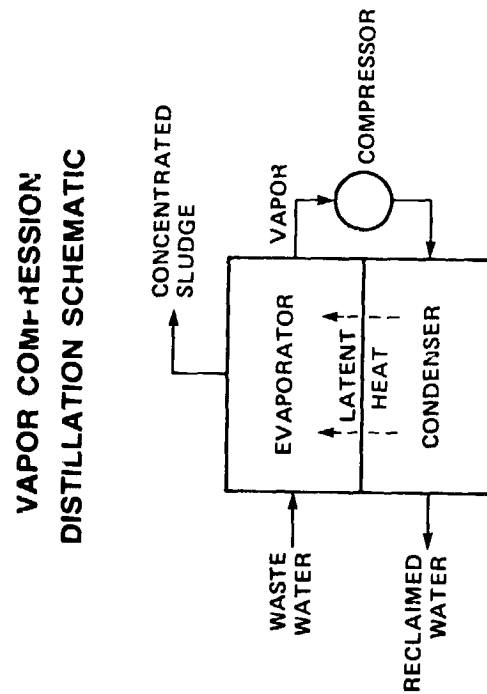
ADVANCED N₂ GENERATION MODULE



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FIGURE 25

VAPOR COMPRESSION DISTILLATION SUB-
SYSTEM SCHEMATIC



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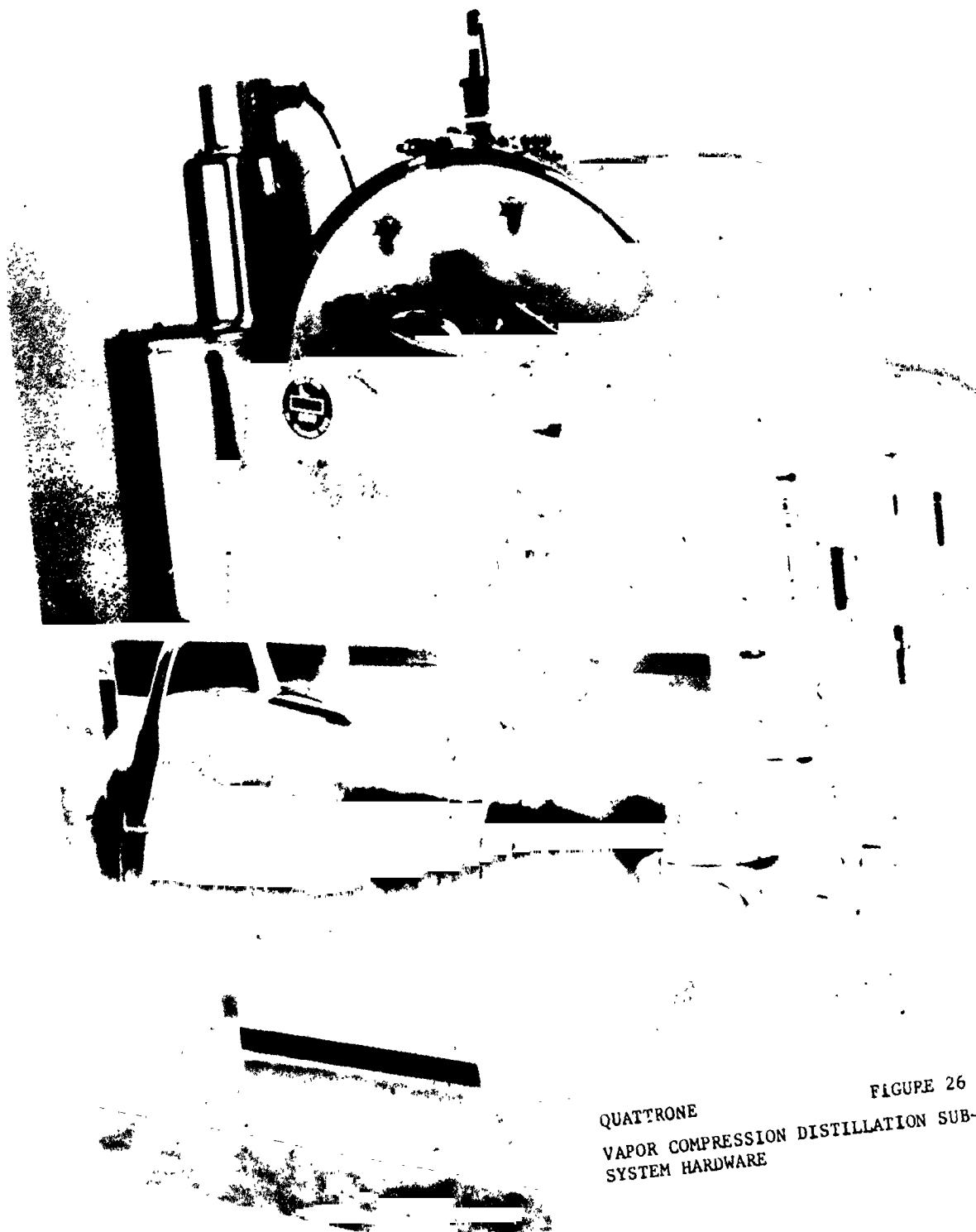
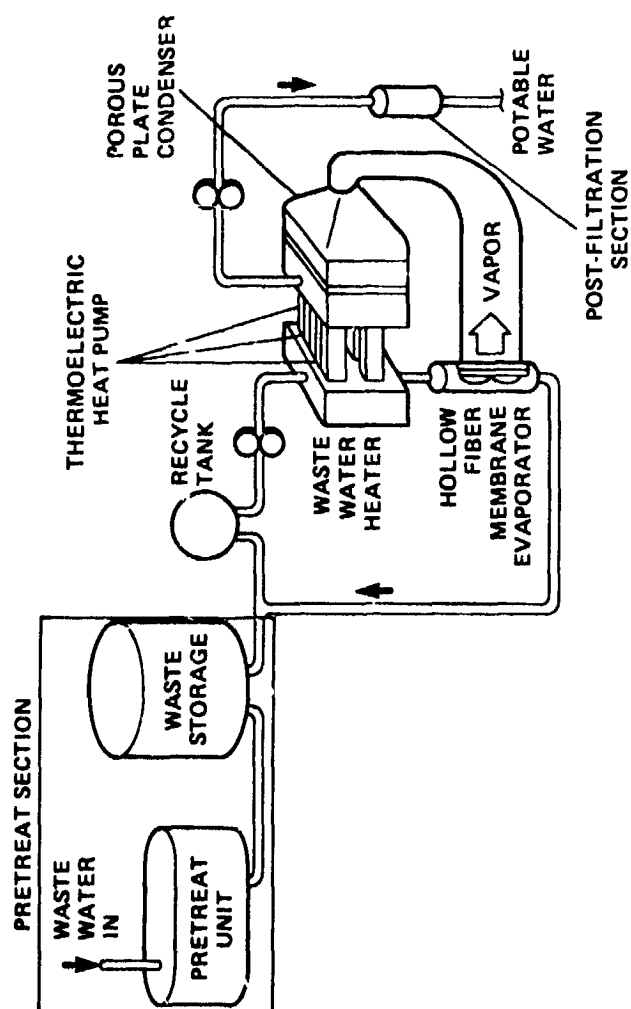


FIGURE 26
QUATTRONE
VAPOR COMPRESSION DISTILLATION SUB-
SYSTEM HARDWARE

THERMOELECTRIC INTEGRATED MEMBRANE EVAPORATION SUBSYSTEM FUNCTIONAL SCHEMATIC



QUATTRONE

FIGURE 27

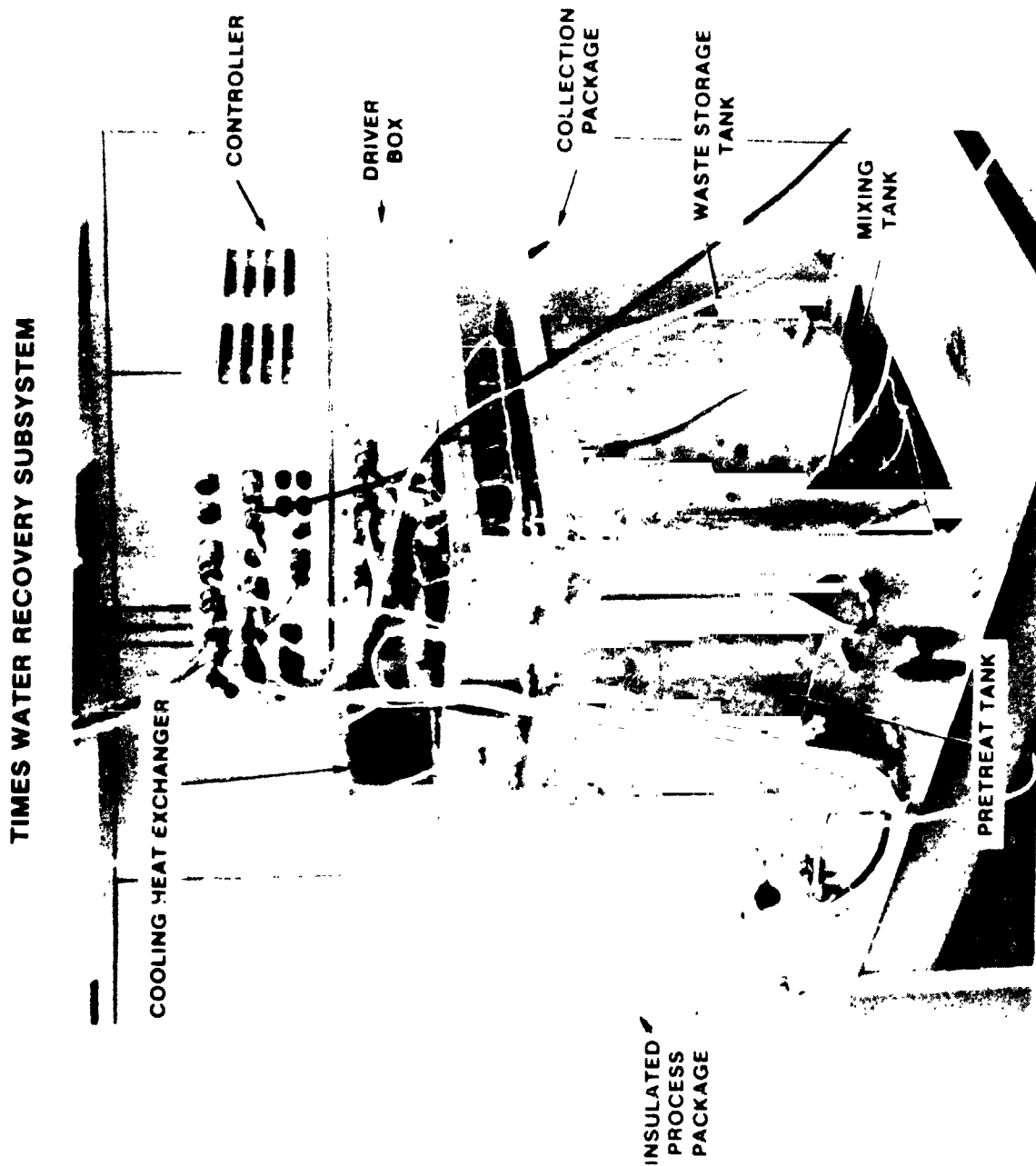
THERMOELECTRIC INTEGRATED MEMBRANE
EVAPORATION SUBSYSTEM SCHEMATIC

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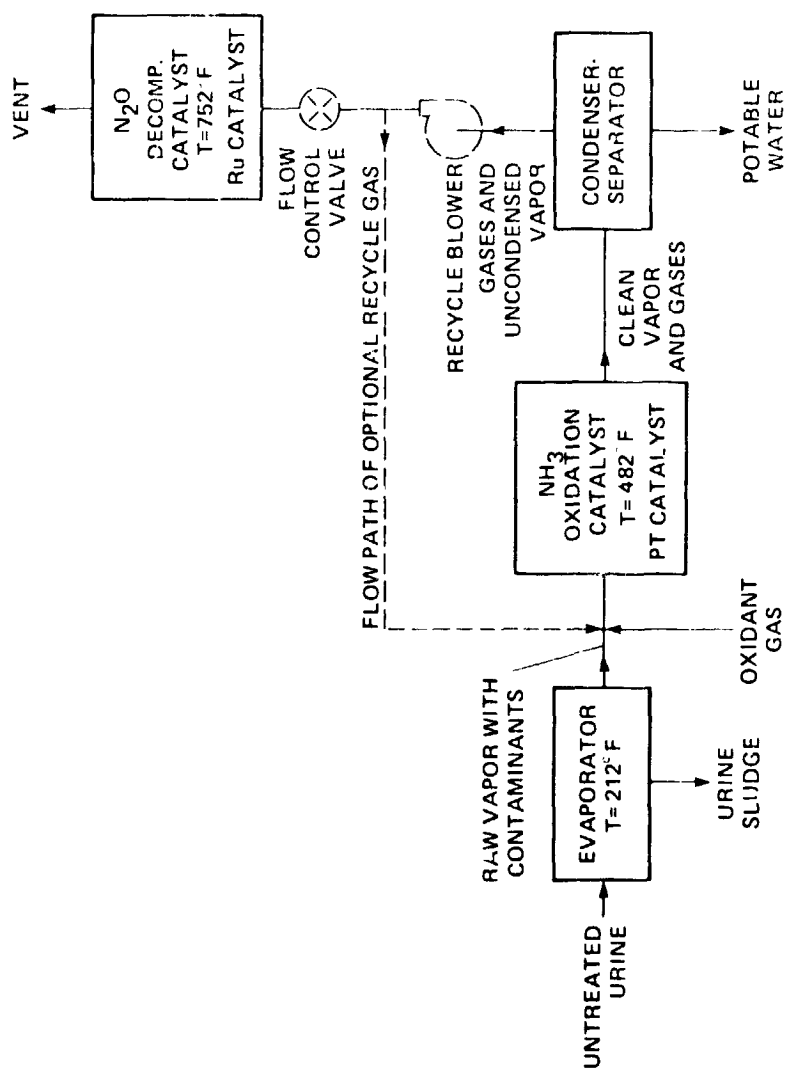
QUATTRONE

FIGURE 28

THERMOELECTRIC INTEGRATED MEMBRANE
EVAPORATION SUBSYSTEM HARDWARE



VAPOR PHASE CATALYTIC AMMONIA REMOVAL FUNCTIONAL SCHEMATIC



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FIGURE 29

CATALYTIC DISTILLATION WATER RECLAMATION
SUBSYSTEM SCHEMATIC

QUATTRONE

FIGURE 30

SPACE SHUTTLE SOLID WASTE MANAGEMENT
SYSTEM

